REMARKS

Applicants would like to thank the Examiner for the thorough examination of the present application. The arguments supporting patentability of the claims are presented in detail below.

I. The Claims Are Patentable

The Examiner rejected independent Claims 25, 31, 35 and 42 over the Grabb et al. patent in view of the Twitchell et al. patent. The present invention, as recited in independent Claim 25, for example, is directed to method for mitigating multipath in a digital television signal (DTV). The method comprises multiplexing reference data with DTV data to generate a multiplexed DTV data stream, and modulating the multiplexed DTV data stream for transmission. The method further comprises receiving a transmitted DTV signal, detecting correlation peaks in the received DTV signal based upon the multiplexed reference data, and using the detected correlation peaks to mitigate multipath in the received DTV signal.

The present invention advantageously mitigates multipath by modulating the DTV data along with reference data. Since the DTV data and the reference data are multiplexed prior to modulation, they are less likely to interfere with one another during transmission. The reference data allows a receiver to detect correlation peaks in the received DTV signal based upon the multiplexed reference data, and the detected correlation peaks are used to mitigate multipath in the received DTV signal.

Independent method Claim 31 is similar to

independent method Claim 25 except this claim is directed to the transmitter functions. Independent device Claim 35 is similar to independent method Claim 25, and is directed to digital television (DTV) system comprising a transmitting system and a receiving system. Independent device Claim 42 is directed to a digital television (DTV).

Referring now to the Grabb et al. patent, and to FIG. 1 in particular, a wideband overlay sequence generator **103** provides an overlay signal (i.e., reference data) that is added to the DTV signal to be transmitted. The overlay signal allows a receiver to estimate the transmission channel and allow mitigation of changing multipath conditions. In particular, periodic correlation peaks are detected in the received overlay signal received by the receiver, and the timing and magnitudes of the peaks in the received overlay signal are used to mitigate multipath in the received signal.

As correctly noted by the Examiner, the overlay signal in Grabb et al. is added after the DTV data has been modulated. Reference is directed to column 4, lines 8-14 of Grabb et al., which provides:

> "For the present invention, the DTV transmitter overlays an ultra wideband, relatively low power noise-like transmission centered on its associated 8-VSB (vestigial sideband) DTV signal in order to provide a convenient and highly effective way to fine-grain characterize the outdoor and indoor multipath limited channel in order that the multipath effects may be mitigated and the ghosts significantly reduced." (Emphasis added.)

In other words, the DTV data to be transmitted is

first modulated (i.e., 8-VDB modulation), then the overlay signal is added via adder **104** prior to transmission.

The Examiner cited the Twitchell et al. patent as disclosing in FIG. 1 the multiplexing of ancillary data **112** (i.e., reference data) with the video and audio signals **108, 110** prior to being modulated. The Examiner has taken the position that it would have been obvious to one skilled in the art at the time of the invention to incorporate the multiplexer and the modulation as taught by Twitchell et al. into the system disclosed by Grabb et al.

The Applicants respectfully disagree and assert that even if the references were selectively combined as suggested by the Examiner, the claimed invention is still not produced. First, Grabb et al. discloses using detected correlation peaks in the received digital television signal based upon the overlay signal (i.e., reference data) provided by the wideband overlay sequence generator **103**, but Grabb et al. fails to teach or suggest multiplexing the overlay signal with the digital television signal prior to being modulated.

Second, the ancillary data **112** multiplexed with the digital television signals in Twitchell et al. does not have anything to do with mitigating multipath. Reference is directed to column 3, lines 40-43 of Twitchell et al., which provides:

> "The ancillary signal **112** and control signal **114** may include control data, conditional access control data and data associated with the audio and video services, such as closed captioning." (Emphasis added.)

Instead, Twitchell et al. discloses a channel coder **120** for adding additional information to the modulated digital television signal that may be used by the receiver to reconstruct the data affected by typical transmission interference sources, such as multipath. Reference is directed to column 3, lines 58-62 of Twitchell et al., which provides:

> "A channel coder **120** may modify the data stream and add additional information that can be used by the receiver to reconstruct the data from a received signal which has been affected by typical transmission interference sources." (Emphasis added.)

In other words, the ancillary data **112** multiplexed with the video and audio signals prior to being modulated in Twitchell et al. is not directed toward mitigating multipath in the received digital television signal. Instead, the channel coder **120** provides additional data associated with the audio and video services directed after the video and audio signals have been modulated to mitigate transmission interference sources such as multipath.

Grabb et al. thus discloses that the overlay signal (i.e., reference data) is added to the digital television signal after having been modulated to mitigate multipath in the received digital television signal. Likewise, Twitchell et al. discloses a channel coder **120** for adding additional information to the digital television signal after modulation to mitigate multipath in the received digital television signal. The ancillary and control data **112, 114** is directed to control data, conditional access control data and data

associated with the audio and video services, such as closed captioning - which has nothing to do with mitigating multipath in the received digital television signal.

Accordingly, it is submitted that independent Claim 25 is patentable over Grabb et al. in view of Twitchell et al. Independent Claims 31, 35 and 42 are similar to independent Claim 25. Accordingly, it is also submitted that independent Claims 25, 31, 35 and 42 are patentable over Grabb et al. in view of Twitchell et al. In view of the patentability of independent Claims 25, 31, 35 and 42, it is submitted that their dependent claims, which recite yet further distinguishing features of the invention, are also patentable. These dependent claims require no further discussion herein.

CONCLUSION

In view of the arguments provided herein, it is submitted that all the claims are patentable. Accordingly, a Notice of Allowance is requested in due course. Should any minor informalities need to be addressed, the Examiner is encouraged to contact the undersigned attorney at the telephone number listed below.

Respectfully submitted,

MICHAEL W. TAYLOR
Reg. No. 43,182
Allen, Dyer, Doppelt, Milbrath
& Gilchrist, P.A.
255 S. Orange Avenue, Suite 1401
Post Office Box 3791
Orlando, Florida 32802
407-841-2330

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